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10/713,240	11/13/2003	Khaled El-Maleh	030361	1165

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EXAMINER	
VO, TUNG T	
ART UNIT	**PAPER NUMBER**
2621	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/713,240	EL-MALEH ET AL.	
	Examiner	Art Unit	
	Tung Vo	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _03_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _15 July 2008_.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-68_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-68_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _11/13/03_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the specification discloses ***a storage medium*** in paragraph [0062] of the application publication, the specification does not disclose ***"a computer-readable"*** storage medium.

Claim Rejections - 35 USC § 101

2. Claims 53-65 are rejected under 35 U.S.C. 101 because ***"instructions"*** as nonfunctional descriptive material is recorded on some computer-readable medium, in a computer or on an electromagnetic carrier signal, it is not statutory since no requisite functionality is present to satisfy the practical application requirement. Merely claiming nonfunctional descriptive material, i.e., abstract ideas, stored on a computer-readable medium, in a computer, or on an electromagnetic carrier signal, does not make it statutory. **MPEP 2106.01 [R-6] Computer-Related Nonstatutory Subject Matter.**

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Chung et al. (US 6,421,386) as set forth in the previous Office Action dated 04/15/2008.

In the remarks filed on 07/15/2008, Applicant states that Chung fails Chung fails to disclose using texture information in the portion of the video frame to determine whether the portion comprises at most a predetermined amount of spatial information and, if the texture information indicates that the portion comprises at most the predetermined amount of spatial information, then categorizing the portion as nonpredictive.

The examiner respectively disagrees with the applicant. It is submitted that Chung discloses method for categorizing (the motion estimation (13 of fig. 2) is enable to determine or identify inter and intra macroblocks or a marcoblock as a portion of the video frame, e.g. the intra macroblock is determined when the motion estimation detects non change in pixels of the macroblock, and the inter macroblock is determined when the motion estimation detects a change in pixels of the macroblock) a portion of a video frame, comprising: using texture information (input texture information, fig. 2, col. 3, lines 18-34, the motion estimation and motion compensation (13 and 14 of fig. 2) using the texture information to determine the portion of the video image) in the portion to determine whether the portion comprises at most a predetermined amount of spatial information (col. 7, lines 27-31, 13 and 14 of fig. 2); and if the texture information indicates that the portion comprises at most the predetermined amount of spatial information (col. 7, lines 31-34), then categorizing the portion as nonpredictive (intra coding method is spatial coding or nonpredictive coding), wherein the texture information

comprises texture bits (input texture information). In view of the discussion above, Chung clearly anticipates the claimed invention.

5. Claims 1-2 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhang et al. (US 7,280,597) as set forth in the previous Office Action dated 04/15/2008.

In the remarks filed on 07/15/2008, Applicant argues that Zhang does not teach using texture information in the portion of the video flame to determine whether the portion comprises at most a predetermined amount of spatial information and, if the texture information indicates that the portion comprises at most the predetermined amount of spatial information, then categorizing the portion as nonpredictive.

The examiner respectfully disagrees with the applicant. It is submitted that Zhang discloses a method for categorizing a portion of a video frame (macroblocks of a frame), comprising: using texture information (col. 5, lines 44-47, 320 of fig. 3) in the portion to determine whether the portion comprises at most a predetermined amount of spatial information (310 and 360 of fig. 3, motion estimation determines motion vectors, and motion compensation use motion vectors to determine inter and intra predictions); and if the texture information indicates that the portion comprises at most the predetermined amount of spatial information (most intra macroblocks), then categorizing the portion as nonpredictive (380 of fig. 3, intra mode when no motion compensation (MC) mode). In view of the discussion above, the Zhang anticipates the claimed limitations.

6. Claims 12, 18-24, 24, 26-28, 46, 53, and 65 are rejected under 35 U.S.C. 102(e) as being anticipated by Yasunari et al. (US 6,697,430).

Re claims 12, 23, 26, 28, 46, and 53, Yasunari discloses apparatus (fig. 1) for carrying out a method for selectively encoding a current macroblock using nonpredictive encoding or predictive encoding (109 of fig. 1), comprising:

means using texture information of the current macroblock to determine whether to nonpredictively encode the current macroblock (101, 102, 103 and type picture of fig. 1); and

means upon determining (104-110 of fig. 1) not to nonpredictively encode the current macroblock based on the texture information, using motion information of the current macroblock to determine whether to predictively encode the current macroblock (104-107 of fig. 1).

Re claims 18, 24, 27, and 65, Yasunari discloses an apparatus for carrying out a method for selectively reducing processing cycles of a video codec, comprising: means receiving a configuration signal (Video Signal, 101 of fig. 1); and means (101 and 102 of fig. 1) configuring at least one variable (103-110 of fig. 1) within a complexity control algorithm (102, 108-110 of fig. 1) in accordance with the configuration signal, wherein complexity control algorithm (102, 108-110) categorizes portions of a predictive video frame (col. 2, lines 53-61, B frame is a predicted frame) as nonpredictive portions (intra macroblocks, 103 of fig. 1, generating the nonpredictive portions of the B frame) when texture information of the portions indicates there is less than or equal to a predetermined amount of spatial information and configuring the at least one variable of the complexity control algorithm (102, 108-110 of fig. 1) increases selectively increasing the number of portions in the predictive video frame (B frame) characterized as

nonpredictive encoded portions (intra coding mode selected, the variable length encoder (113 of fig. 1) encodes the nonprective portions) based upon the texture information.

Re claims 19-22, Yasunari teaches MPEG-encoder that inherently receives the configuration signal conveys image size information (I, P, B pictures inherently have size information); transmission frame rate information (MPEG-standards inherently has a transmission frame rate), a user command; information regarding available hardware resources (MPEG-Encoder is hardware resources).

7. Claims 12-18, 23-24, 26-30, 37, 46-50, 53-61, and 66 are rejected under 35 U.S.C. 102(b) as being anticipated by Iverson et al. (US 5,832,234).

Re claim 49-50, 59-61, Iverson discloses an apparatus (fig. 3) for categorizing a portion of a video frame, comprising:

means (304 of fig. 3) for determining whether the portion comprises at most a predetermined amount of spatial information based on texture information in the portion (INTER-SAD, MAD, & INTRA-SAD MEASURES of fig. 3);

means (306 of fig. 3; see details in figures 6A and 6B) for categorizing the portion as nonpredictive if the texture information indicates that the portion comprises at most the predetermined amount of spatial information (602 and 604 of fig. 6A);

means (302 of fig. 3) for performing a motion estimation search if the texture information indicates that the portion does not comprise at most a predetermined amount of spatial information (MOTION VECOTRS of fig. 3, wherein the motion vectors indicate that the portion is in the INTER-SAD, MAD of fig. 3);

means (306 of fig. 3, figs. 6A and 6B) for determining whether the portion comprises at least a predetermined amount of predictive information (608-622 of figs. 6A and 6B) based on motion information determined during the motion estimation search (302 of fig. 3, MOTION VECTORS are sent to the BLOCK CLASSIFICATION, 304 of fig. 3);

wherein the categorizing means (306 of fig. 3) categorizes the portion as predictive (608-622 of figs. 6A and 6B) if the motion information (MOTION VECTORS of fig. 3) indicates that the portion comprises at least the predetermined amount of predictive information (ENCODE ALL NON-EMPTY BLOCKS OF MACRBLOCK AS INTER BLOCKS, 622 of fig. 6B) and

categorizes the portion as nonpredictive if the motion information indicates that the portion does not comprise at least the predetermined amount of predictive information (624-628 of fig. 6B, ENCODE ALL BLOCKS OF MACROBLOCKS AS INTRA BLOCKS); means (304 of fig. 1; INTER-SAD, MAD, & INTRA-SAD MEASURES) for calculating a variance value of the portion of the video frame to generate the texture information; and means (col. 5, lines 42-67) for comparing the calculated variance value of the portion of the video frame to an average variance value of at least one other video frame; wherein the categorizing means (306 of fig. 3) categorizes the portion as nonpredictive (Intra block) if the variance value of the portion is less than the average variance value of the at least one other video frame (INTRA-SAD < the motion-compensated INTER-SAD, col. 5, lines 54-67); wherein motion information comprises pixel differences between the portion of the video frame and at least a portion of at least one other video frame (302 of fig. 3); if the pixel differences between the current macroblock and the macroblock from another video frame is less than a configurable threshold value, then determine to predictively encode the current macroblock (612 and 614 of fig. 6A).

Re claims 12-17, see analysis in claims 49-50;

Re claims 18, 24, 27 see analysis in claim 40;

Re claims 23 and 37, see analysis in claims 49-50;

Re claims 26 and 66, see analysis in claims 49-50;

Re claims 28-30, see analysis in claims 49-50;

Re claims 46-48, see analysis in claims 49-50;

Re claims 53-58, see analysis in claims 49-50.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 19-22, 31-34, 36-41, 44-45, 51-52, 63-65, and 67-68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iverson et al. (US 5,832,234) in view of Kim (US 2002/0196854).

Re claims 19-22, 33-34, 39-41, 63-65, Iverson further teaches the encoder system (figs. 1 and 3) would obviously receive the configuration signal conveys one of image size information (fig. 4), transmission frame rate information (310 of fig. 3), a user command (116 of fig. 1), and information regarding available hardware resources (e.g. 102 of fig.1); wherein instructions to cause the processor to configure at least one variable within a complexity control algorithm further comprise instructions that cause the processor to adjust the predetermined amount of

spatial information (316 of fig. 3); wherein receiving a configuration signal comprises receive a configuration signal that originates from a network (102 of fig. 1, 118 of fig. 1).

Re claims 31-32, 36-38, 44-45, 51-52, and 67-68, Iverson further teaches the portion is categorized as predictive (figs. 6A and 6B), the quality metric comprises a sum of absolute difference (SAD) between pixel values of the portion and pixel values of a portion of at least one other video frame (304 of fig. 4), comparing SAD to a threshold SAD value (608-622 of figs. 6A and 6B), except whether to perform fractional-pixel motion estimation based on a quality metric associated with the portion; and performing fractional-pixel motion estimation when the SAD is less than the threshold SAD value; and bypassing the fractional-pixel motion estimation when the SAD is greater than or equal to the threshold SAD value.

However, Kim teaches a sum of absolute difference (SAD) between pixel values of the portion and pixel values of a portion of at least one other video frame (3200 of fig. 4), comparing SAD to a threshold SAD value (3300 of fig. 4, wherein VAR' as a threshold SAD value, [0047]); and performing fractional-pixel motion estimation when the SAD is less than the threshold SAD value (3400 of fig. 4, wherein half pixels if further calculated in fig. 6) ; and bypassing the fractional-pixel motion estimation when the SAD is greater than or equal to the threshold SAD value (INTRA coding mode, the motion estimation performs full pixel).

Taking the teachings of Iverson and Kim as a whole, it would have been obvious to one of ordinary skill in the art to modify the teachings of Kim into the apparatus of Iverson to allow a video encoding method and apparatus is presented that substantially reduces the computational requirements for motion processing by analyzing macro-blocks of down-sampled video frames

to determine down-sample motion vectors from which motion vectors for the macro-blocks of the video frames are derived.

10. Claims 13-14, 29-30, 35, 42, 47-48, 54-55, and 66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yasunari et al. (US 6,697,430) in view of Kato (US 6,415,055).

Re claims 13-14, 29-30, 35, 42, 47-48, 54-55, and 66, Yasunari does not particularly disclose calculating a variance value of the portion of the video frame to generate the texture information; wherein the predetermined amount of spatial information is an average variance value of at least one other video frame, the method further comprising: comparing the calculated variance value of the portion of the video frame to the average variance value of the at least one other, video frame; and if the variance value of the portion is less than the average variance value of the at least one other video frame, categorizing the portion as nonpredictive; wherein the average variance value predetermined amount of spatial information is a scaled average variance values of at least one other another video frame as claimed.

However, Kato teaches calculating a variance value of the portion of the video frame to generate the texture information (col. 10, lines 9-col. 11, line 12, e.g. Eintra and Einter as variances); wherein the predetermined amount of spatial information is an average variance value of at least one other video frame (Einter= ½ (Ef+Eb), as average variance), comparing the calculated variance value of the portion of the video frame to the average variance value of the at least one other, video frame (Eintra<Einter, col. 11, lines 1-12); and if the variance value of the portion is less than the average variance value of the at least one other video frame (YES, Eintra<(Einter= ½ (Ef=Eb)), categorizing the portion as nonpredictive (the intra mode is select,

which means the portion is intra macroblock); wherein the average variance value predetermined amount of spatial information is a scaled average variance (1/2(Ef+Eb), col. 10, lines 65-67) value of at least one other video frame.

Taking the teachings of Yasunari and Kato as a whole, it would have been obvious to one of ordinary skill in the art to modify the teachings of Kato into the apparatus of Yasunari to provide a moving image encoding method and apparatus which is capable of increasing coding efficiency even in a case of a prediction structure where two or more B-pictures exist between I- and P-pictures or between P-pictures.

11. Claims 15-17, 36, 43, 56-58, and 68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yasunari et al. (US 6,697,430) in view of Sun (US 6,014,181).

Re claims 15-17, 36, 43, 56-58, and 68, Yasunari further discloses wherein using motion information of the current macroblock (108 of fig. 1) to determine whether to predictively encode the current macroblock comprises determining pixel differences between the current macroblock and a macroblock from another video frame and determining a sum of absolute distance values between the current macroblock and macroblocks from at least one other video frame (col. 2, lines 53-61; figs. 3-4), if the pixel differences between the current macroblock and the macroblock from another video frame is less than a configurable threshold value, then determining to predictively encode the current macroblock (108 of fig. 1, determining the predictive coding current macroblock, figs. 3 and 4).

It is noted that Yasunari does not particularly teaches if the sum of absolute distance values is less than a scaled average minimum sum of absolute distance values of macroblocks from at least one other video frame, then determining predictively encode the current

macroblock; wherein the scaled average minimum sum of absolute distance values is configurable.

Sun teaches differencing between the current block of the current image and the previous macroblocks of the previous image and sum of absolute distance values (figs. 6A and 6B) for predictive coding, wherein if the sum of absolute distance values is less than a scaled average minimum sum of absolute distance values of macroblocks from at least one other video frame, then determining predictively encode the current macroblock (cols 11 and 12; SAD_init<SAD_ave; SAD_ave = (1/numMB)((NumMB-1)*(SAD_ave)0+SAD_min), wherein 1/numMB is a scaling factor); wherein the scaled average minimum sum of absolute distance values is configurable (SAD_ave is configured).

Taking the teachings of Yasunari and Sun as a whole, it would have been obvious to one of ordinary skill in the art to incorporate the teachings of Sun into the apparatus of Yasunari to provide the adaptive algorithm that improves motion estimation and hence overall video encoding speed.

12. Claims 37-38, 44-45, and 67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yasunari et al. (US 6,697,430) in view of Kim (US 2002/0196854).

Re claims 37-38, 44-45, and 67, Yasunari further teaches the portion is categorized as predictive (101-107 of fig. 1), except whether to perform fractional-pixel motion estimation based on a quality metric associated with the portion; the quality metric comprises a sum of absolute difference (SAD) between pixel values of the portion and pixel values of a portion of at least one other video frame, comparing SAD to a threshold SAD value; and performing

fractional-pixel motion estimation when the SAD is less than the threshold SAD value; and bypassing the fractional-pixel motion estimation when the SAD is greater than or equal to the threshold SAD value.

However, Kim teaches a sum of absolute difference (SAD) between pixel values of the portion and pixel values of a portion of at least one other video frame (3200 of fig. 4), comparing SAD to a threshold SAD value (3300 of fig. 4, wherein VAR' as a threshold SAD value, [0047]); and performing fractional-pixel motion estimation when the SAD is less than the threshold SAD value (3400 of fig. 4, wherein half pixels if further calculated in fig. 6) ; and bypassing the fractional-pixel motion estimation when the SAD is greater than or equal to the threshold SAD value (INTRA coding mode, the motion estimation performs full pixel).

Taking the teachings of Yasunari and Kim as a whole, it would have been obvious to one of ordinary skill in the art to modify the teachings of Kim into the apparatus of Yasunari to allow a video encoding method and apparatus is presented that substantially reduces the computational requirements for motion processing by analyzing macro-blocks of down-sampled video frames to determine down-sample motion vectors from which motion vectors for the macro-blocks of the video frames are derived.

13. Claims 1-2, 6-7, 11, 25, and 43-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sekiguchi et al. (US 6,108,449) as set forth in the previous Office Action dated 04/15/2008.

Re claims 43-44, Sekiguchi further teaches wherein motion information comprises pixel differences between the portion of the video frame and at least a portion of at least one other

video frame (10 of fig. 1); wherein the processing element determines, when the portion is categorized as predictive (13 and 17 of fig. 1), whether to perform fractional-pixel motion estimation based on a quality metric associated with the portion (14 of fig. 1).

In response the arguments filed on 07/15/2008, Applicant argues that Sekiguchi does not teach the claimed invention as specified in claim 1 and 6.

The examiner respectfully disagrees with the applicant. It is submitted that Sekiguchi teaches apparatus for categorizing a portion of a video frame (2 and 9 of fig. 1 are portion of frame, texture and shape, fig. 26), comprising: at least one memory element (e.g. the motion picture encoding system further comprises a unit for enabling the prediction computing unit and the second encoding unit when receiving information for instructing the encoding of the difference between the prediction computed by the prediction computing unit and the actual value of each pixel of the shape data of the second field, and for disabling the prediction computing unit and the second encoding unit otherwise); and at least one processing element (encoding unit, fig. 1) configured to execute a set of instructions stored in the at least one memory element, the set of instructions comprising: using texture information (9 of fig. 1, a texture data is extracted form the VOP data, 10 of fig. 1) in the portion to determine whether the portion comprises at most a predetermined amount of spatial information (9, 10, 13, 14 and 17 of fig. 1, col. 17, lines 9-15, determining the texture data is inter or intra signal); if the texture information indicates that the portion comprises at most the predetermined amount of spatial information (indicating intra signal), then categorizing the portion as nonpredictive (9 of fig. 1, the intra texture information is selected by texture encoding unit 18 as nonpredictive coding); if the texture information indicates that the portion does not comprise at most a predetermined

amount of spatial information (13 and 17 of fig. 1, wherein motion compensation 12 and 16 perform prediction obviously determines inter or intra encoding mode based on the intra or inter texture information), then performing a motion estimation search (10 and 14 of fig. 1); using motion information determined during the motion estimation search to determine whether the portion comprises at least a predetermined amount of predictive information (12 and 16 of fig. 1, the predicting result 13 and 17 of fig. 1); if the motion information indicates that the portion comprises at least the predetermined amount of predictive information, then categorizing the portion as predictive (note the motion compensation unit (12 and 17 of fig. 1) obviously determine the macroblock is inter as predictive portion); and if the motion information indicates that the portion does not comprise at least the predetermined amount of predictive information, then categorizing the portion as nonpredictive (12 and 17 of fig. 1, intra as non-predictive portion). In view of the discussion above, the claimed invention is unpatentable over Sekiguchi.

14. Claims 3-5, 8-10, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sekiguchi et al. (US 6,108,449) in view of Kato (US 6,415,055).

Re claims 3-5, 8-10, and 42, Sekiguchi does not particularly disclose calculating a variance value of the portion of the video frame to generate the texture information; wherein the predetermined amount of spatial information is an average variance value of at least one other video frame, the method further comprising: comparing the calculated variance value of the portion of the video frame to the average variance value of the at least one other, video frame; and if the variance value of the portion is less than the average variance value of the at least one other video frame, categorizing the portion as nonpredictive; wherein the average variance value

predetermined amount of spatial information is a scaled average variance value of at least one other another video frame as claimed.

However, Kato teaches calculating a variance value of the portion of the video frame to generate the texture information (col. 10, lines 9-col. 11, line 12, e.g. Eintra and Einter as variances); wherein the predetermined amount of spatial information is an average variance value of at least one other video frame (Einter= ½ (Ef+Eb), as average variance), comparing the calculated variance value of the portion of the video frame to the average variance value of the at least one other, video frame (Eintra<Einter, col. 11, lines 1-12); and if the variance value of the portion is less than the average variance value of the at least one other video frame (YES, Eintra<(Einter= ½ (Ef=Eb)), categorizing the portion as nonpredictive (the intra mode is select, which means the portion is intra macroblock); wherein the average variance value predetermined amount of spatial information is a scaled average variance (1/2(Ef+Eb), col. 10, lines 65-67) value of at least one other video frame.

Taking the teachings of Sekiguchi and Kato as a whole, it would have been obvious to one of ordinary skill in the art to modify the teachings of Kato into the apparatus of Sekiguchi to provide a moving image encoding method and apparatus which is capable of increasing coding efficiency even in a case of a prediction structure where two or more B-pictures exist between I- and P-pictures or between P-pictures.

15. Claims 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sekiguchi et al. (US 6,108,449) in view of Kim (US 2002/0196854).

1. Re claims 31-32, Sekiguchi further teaches the portion is categorized as predictive (12-13, 16-17 of fig. 1), whether to perform fractional-pixel motion estimation based on a quality metric associated with the portion (field motion estimation and prediction, 14 and 16 of fig. 1), except the quality metric comprises a sum of absolute difference (SAD) between pixel values of the portion and pixel values of a portion of at least one other video frame, comparing SAD to a threshold SAD value; and performing fractional-pixel motion estimation when the SAD is less than the threshold SAD value; and bypassing the fractional-pixel motion estimation when the SAD is greater than or equal to the threshold SAD value.

However, Kim teaches a sum of absolute difference (SAD) between pixel values of the portion and pixel values of a portion of at least one other video frame (3200 of fig. 4), comparing SAD to a threshold SAD value (3300 of fig. 4, wherein VAR' as a threshold SAD value, [0047]); and performing fractional-pixel motion estimation when the SAD is less than the threshold SAD value (3400 of fig. 4, wherein half pixels if further calculated in fig. 6) ; and bypassing the fractional-pixel motion estimation when the SAD is greater than or equal to the threshold SAD value (INTRA coding mode, the motion estimation performs full pixel).

Taking the teachings of Sekiguchi and Kim as a whole, it would have been obvious to one of ordinary skill in the art to modify the teachings of Kim into the apparatus of Sekiguchi to allow a video encoding method and apparatus is presented that substantially reduces the computational requirements for motion processing by analyzing macro-blocks of down-sampled video frames to determine down-sample motion vectors from which motion vectors for the macro-blocks of the video frames are derived.

Conclusion

2. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tung Vo whose telephone number is 571-272-7340. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on 571-272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tung Vo/

Primary Examiner, Art Unit 2621